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A large herd of black cattle, likely a breed like the Braford, is gathered in a lush green field. The cattle are densely packed, and the background shows a fence and more greenery under a bright sky.

Determining critical farm management decision points to improve agrometeorological research and extension

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My Talk

- Overview
- Project components
- Methodology
- Results
- Conclusion



Overview-project

- “Improved use of Seasonal Forecasting to Increase Farmer Profitability”
- 3 years (~July 2015 – June 2018)
- RnD4P; \$2.7m + \$0.8m in kind

Partners (+MCV)



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SARDI



AGRICULTURE VICTORIA



RURAL
INDUSTRIES

Research & Development
Corporation

SOUTH AUSTRALIAN
RESEARCH AND
DEVELOPMENT
INSTITUTE



Department of
Agriculture and Food



UNIVERSITY
OF SOUTHERN
QUEENSLAND



MONASH University

Key Associates



Australian Government
Bureau of Meteorology



Queensland Government
Department of Agriculture
and Fisheries



Project components

1. Valuing the forecast*

- Case study approach* (NSW DPI, some USQ)
- Forecast skill (USQ)

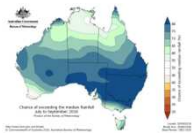
2. Using the forecast (BCG, Vic Ag, SARDI, DAFWA, NSW DPI)

3. Improving the forecast (Monash Uni, BoM)

Project Lead = RIRDC



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SCF relevant to the decision?

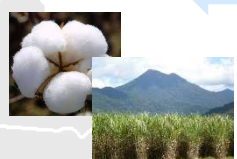


SCF must change a decision to have value

What influences the decision?

Value of Seasonal Climate Forecasts?

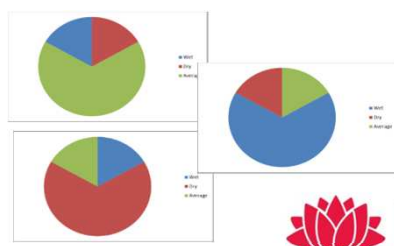
$\{X_1, X_2, X_3, \dots, X_n\}$



- SCF

+ SCF

WHAT IF - THEN?



How Often



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Decision and Decision Environment centric

not

Climate Forecast centric



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Methodology

1. Use a small, well selected stakeholder group to:
2. Identify key management decisions which were potentially sensitive to seasonal climate forecasts;
3. Identify the key drivers of the decision, this includes both antecedent and climate forecast conditions; and
4. understand the relative sensitivities of these drivers.

System

- Beef specialists
- Holbrook (700ha)
- Angus (self replacing)
- Winter/spring calving
- 560 cows

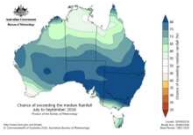




Results

Key decision: How many progeny to sell as weaners in March?

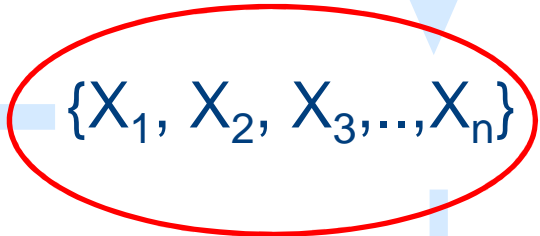
Note: Limits later earning capacity as preferred option is to carry progeny through to higher finished weights as yearlings to be sold in November



SCF must change a decision to have value



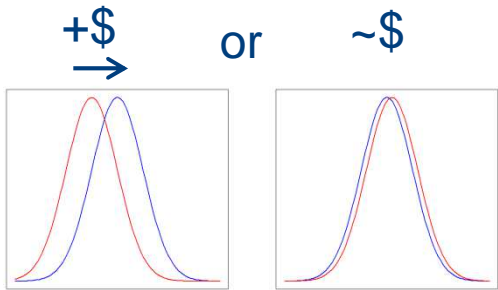
Value of Seasonal Climate Forecasts?



- SCF

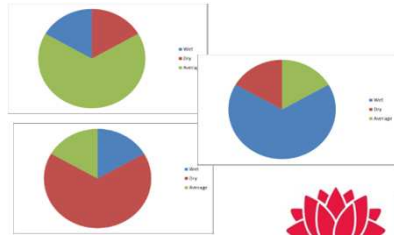
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How Often



Profit

WHAT IF - THEN?



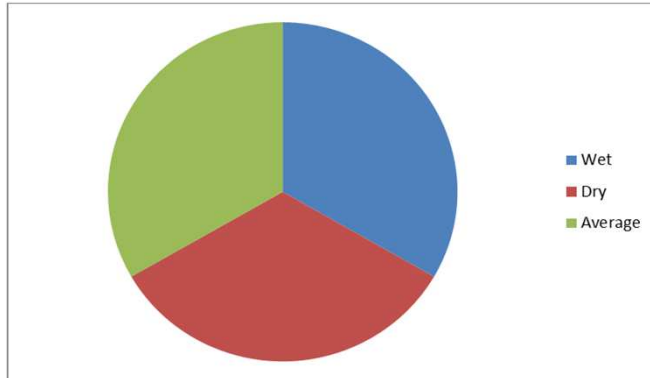
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Results

Group identified 4 influential drivers to the decision.
In order of perceived significance;

1. Cash flow position
2. Relative price of weaners
3. Pasture feed availability (March)
4. Total rainfall for March-April-May (climate forecast)

Seasonal Forecast



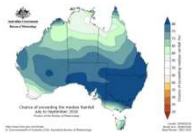
Equal chance/ climatology/ no forecast

MAM rainfall historically at Holbrook

‘Wet’ = increased chance of wet (blue)

‘Average’ = increased chance of average (green)

‘Dry’ = increased chance of dry (red)



SCF relevant to the decision?

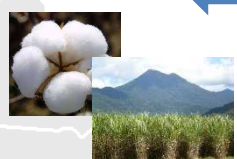


SCF must change a decision to have value

What influences the decision?

Value of Seasonal Climate Forecasts?

$\{X_1, X_2, X_3, \dots, X_n\}$

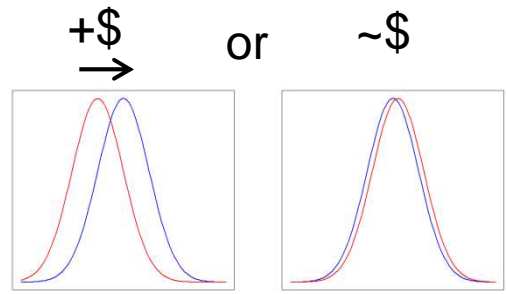


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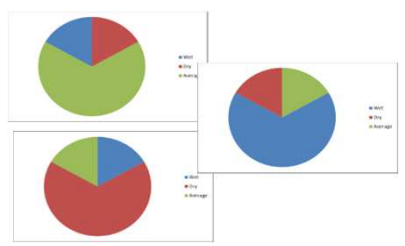
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WHAT IF - THEN?

How Often



Profit





Results

Cash flow	Relative price for EYCI	Feed available	3-month rain forecast	%sell	
OK	Ave	Ave	Equal Chance	10	0% forecast confidence
Low	Ave	Ave	Equal Chance	45	
OK	Low	Low	Dry	50	Low price, low feed
Low	Low	Low	Dry	85++	
OK	Low	Low	Equal Chance	20	
Low	Low	Low	Equal Chance	75	
OK	Low	Low	Wet	10	
Low	Low	Low	Wet	65	
OK	High	Low	Dry	50	High price, low feed
Low	High	Low	Dry	85++	
OK	High	Low	Equal Chance	70	
Low	High	Low	Equal Chance	75	
OK	High	Low	Wet	10	
Low	High	Low	Wet	70	
OK	Low	High	Dry	10	Low price, high feed
Low	Low	High	Dry	45	
OK	Low	High	Equal Chance	0	
Low	Low	High	Equal Chance	40	
OK	Low	High	Wet	0	
Low	Low	High	Wet	40	
OK	High	High	Dry	30	High price, high feed
Low	High	High	Dry	60	
OK	High	High	Equal Chance	10	
Low	High	High	Equal Chance	50	
OK	High	High	Wet	0	
Low	High	High	Wet	75	

Conclusions

- Collaborative approach with industry ensures research questions are well framed and reflect decision environment of each industry.
- Complex explanation and education of forecasts were not required and likely would have hindered process.
- Limited number of critical decision points sensitive to climate forecasts (and most case studies).
- Weighting of climate forecast low in comparison to other nominated antecedent conditions ('cream').
- Important to understand potential application of a forecast and benefit prior to extending climate forecast education materials/ developing support tools.

Next Steps

- Biophysical and economic analyses of Sth beef case study 
- Evaluate decision points and decision environments for 8 other Australian case studies 
- Conduct economic analyses for all case studies and contrast



Coming in
May 2018



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Thank You

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